CLAIMS

1. A method for manufacturing a glass substrate for an information recording medium including a step for forming a texture on a main surface of a disc-shaped glass plate by supplying an abrasive agent containing an abrasive grain to the main surface and slidably contacting the main surface with an abrasive member, the method being characterized by:

oscillating either one of the abrasive member and the glass plate in a radial direction of the glass plate with respect to the other one of the abrasive member and the glass plate while rotating the glass plate so that the abrasive grain cyclically draws a one-stroke closed track that intersects in at least three locations on the main surface of the glass plate.

2. The manufacturing method according to claim 1, characterized in that a frequency F (Hz) of the oscillation and a rotation speed R (min^{-1}) of the glass plate are determined so that the rotation speed R is outside a range of $(F \times 60) \pm 5$.

3. The manufacturing method according to claim 1 or 2, characterized in that the one-stroke closed track includes at least five intersections.

4. The manufacturing method according to any one of claims 1 to 3, characterized in that the frequency of oscillation is greater than 0 Hz but 20 Hz or less.

5. The manufacturing method according to any one of claims 1 to 4, characterized in that the rotation speed is 240 to 540 min^{-1}.

6. The manufacturing method according to any one of claims 1 to 5, characterized in that a stroke of the oscillation is 0.5 to 2 mm.

7. The manufacturing method according to any one of claims 1 to 6, characterized in that the abrasive member is a roller made of an elastic material having a duro hardness, as defined by ISO 7627-2, of 40 to 90.

8. The manufacturing method according to any one of claims 1 to 6, further being characterized by:

scrubbing the main surface of the glass plate with a scrubbing material in which a 100% modulus, as defined by JIS K7113, is 2.9 to 39.2 MPa after said forming a texture.

9. The manufacturing method according to any one of claims 4 to 6, characterized in that the frequency of oscillation is greater than 0 Hz but 4 Hz or less when an outer diameter of the glass plate is 48 mm or less, and the frequency of oscillation is greater than 4 Hz but 20 Hz or less when the outer diameter is greater than 48mm.

10. A method for manufacturing a glass substrate for an information recording medium, the method being characterized by the steps of:

preparing a disc-shaped glass plate having a main surface and a central circular hole; and

forming on the main surface a texture including a plurality of grooves, each extending along a closed curve that intersects in at least three locations around the central circular hole.

11. The manufacturing method according to claim 10,

characterized in that the step for forming a texture includes:

supplying an abrasive agent containing an abrasive grain to the main surface of the glass plate;

pressing an abrasive member against the main surface of the glass plate;

cyclically oscillating either one of the glass plate or the abrasive member in the radial direction of the glass plate; and

rotating the glass plate at a constant speed.

12. The manufacturing method according to claim 11, characterized in that the step for forming a texture includes determining the rotation speed, frequency of oscillation, and stroke of oscillation of the glass plate.

13. The manufacturing method according to claim 12, characterized in that the stroke of oscillation is 0.5 to 2 mm, and the frequency F (Hz) of oscillation and the rotation speed R (min^{-1}) of the glass plate are determined so that the rotation speed R is outside the range of (F×60)±5.

14. The method of manufacturing according to claim 13, characterized in that the frequency of oscillation is changed in accordance with an outer diameter dimension of the glass plate.

15. A glass substrate for an information recording medium having a main surface on which a texture is formed, characterized in that:

the main surface has an arithmetic mean roughness Ra, as measured by an atomic force microscope, of 0.5 nm or less, and the main surface has a microscopic undulation

height NRa of 0.2 nm or less, as measured by a three-dimensional surface structure analyzing microscope using light having a measuring wavelength of 0.2 to 1.4 mm.

16. The glass substrate according to claim 15, characterized in that:

the texture includes a plurality of projections; and

in a region having a predetermined reference area in the main surface, when setting a hypothetical reference plane traversing the plurality of projections so that a total value of a cross sectional area of the plurality of projections is 50% relative to the reference area,

a first hypothetical plane parallel to the main surface and traversing the plurality of projections so that the total value of the cross sectional area of the plurality of projections is 0.4% relative to the reference area is separated from the hypothetical reference plane by a first distance,

a second hypothetical plane parallel to the main surface and traversing the plurality of projections so that the total value of the cross sectional area of the plurality of projections is 0.01% relative to the reference area is separated from the hypothetical reference plane by a second distance, and

the difference between the first distance and the second distance is 0.01 to 1.0 nm.

17. A disc-shaped glass substrate for an information recording medium including a central circular hole and a main surface, characterized by a texture including a plurality of grooves, each extending along a closed curve that intersects in at least three locations around the central circular hole, formed on the main surface.